REMARKS

Applicants request favorable reconsideration of this application in view of the foregoing amendments and the following remarks. Claims 1-15 were pending in the application and were rejected in the Office Action. By way of this amendment, Applicants have: (a) cancelled claim 2, without prejudice or disclaimer; and (b) amended claims 1, 3-6, 8-11, and 13-15. Accordingly, claims 1 and 3-15 remain pending for further consideration.

1. Rejection of Claim 14 under 35 U.S.C. § 112

The Examiner rejected claim 14 under 35 U.S.C. § 112, ¶ 2 as allegedly being indefinite. Applicants respectfully submit that this rejection is now moot due to the amendments made herein to claim 14. Accordingly, a withdrawal of this rejection is both warranted and respectfully requested.

2. Rejection of Claims 1-15 under 35 U.S.C. § 102

The Examiner rejected: (a) claims 1-3, 8, 9, and 15 under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent Publication No. 2002/0170769 ("Sakaki"); and (b) claims 1-15 under 35 U.S.C. § 102(e) as allegedly being anticipated by U.S. Patent Publication No. 2003/0178241 ("Yokota"). For at least the following reasons, Applicants respectfully traverse both of these rejections.

As amended herein, claim 1 (*i.e.*, the claim from which claims 3-13 depend) recites a power steering system that includes, among other possible things (italic emphasis added):

> a torque sensor that is configured to sense a steering torque;
> first and second passages, each including a pump-side portion and a cylinder-side portion;
> a hydraulic cylinder with first and second chambers, the first and second chambers being connected to the first and second passages, respectively;
> a hydraulic pump which is configured to supply and discharge a hydraulic pressure to and from the first and second chambers of the hydraulic cylinder in accordance with the steering torque sensed by the torque sensor;
> a drain passage connected to at least one of the first and second passages; and
> a switching valve arranged at a connection of the drain passage and the at least one passage,
> wherein when the hydraulic pump operates to discharge the hydraulic pressure to the at least one passage, the switching valve provides a fluid communication between the pump-side and cylinder-side portions of the at least one passage and closes-off the drain passage, and

wherein when the hydraulic pump stops, the switching valve provides a fluid communication between the cylinder-side portion of the at least one passage and the drain passage,

wherein the switching valve comprises a valve body formed with a plurality of passage holes communicating with the pump-side and cylinder-side portions of the at least one passage and the drain passage,

wherein a spool valve element is slidably arranged in the valve body and comprises a first valve portion for opening and closing the passage holes corresponding to the pump-side and cylinder-side portions and a second valve portion for opening and closing the passage hole corresponding to the drain passage, and

wherein a resilient member is configured to bias the spool valve element in the direction of closing-off a fluid communication between the pump-side and cylinder-side portions by the first valve portion and is configured to provide a fluid communication between the cylinder-side portion and the drain passage by the second valve portion.

Similarly, as amended claim 14 recites a power steering system that includes, among other possible things (italic emphasis added):

a torque sensor that senses a steering torque;

first and second passages, each including a pump-side portion and a cylinder-side portion;

a hydraulic cylinder with first and second chambers, the first and second chambers being connected to the first and second passages, respectively;

a hydraulic pump which is configured to supply and discharge a hydraulic pressure to and from the first and second chambers of the hydraulic cylinder in accordance with the steering torque sensed by the torque sensor;

first and second drain passages connected to the first and second passages, respectively;

first and second switching valves arranged at connections of the first and second drain passages and the first and second passages, respectively, wherein:

when the hydraulic pump operates to discharge the hydraulic pressure to one of the first and second passages, the corresponding switching valve provides fluid communication between the pump-side and cylinder-side portions of the one passage and closes-off the corresponding drain passage, and

when the hydraulic pump stops, the corresponding switching valve provides fluid communication between the cylinder-side portion of the one passage and the corresponding drain passage;

a back-pressure regulating valve arranged downstream of the first and second drain passages, the back-pressure regulating valve maintaining the hydraulic pressure within a hydraulic circuit at a predetermined value;

a first return passage which connects the first drain passage connected to the first switching valve and the cylinder-side portion of the second passage;

a second return passage which connects the second drain passage connected to the second switching valve and the cylinder-side portion of the first passage; and

first and second check valves provided to the first and second return passages, respectively, each check valve allowing hydraulic fluid to flow from the corresponding drain passage to the cylinder-side portion of the corresponding passage,

wherein the first switching valve comprises a first valve body formed with a first plurality of passage holes communicating with the pump-side and cylinder-side portions of the first drain passage and the first passage,

wherein the second switching valve comprises a second valve body formed with a second plurality of passage holes communicating with the pump-side and cylinder-side portions of the second drain passage and the second passage,

wherein a first spool valve element is slidably arranged in the first valve body and comprises a first valve portion for opening and closing the passage holes corresponding to the associated pump-side and cylinder-side portions and a second valve portion for opening and closing the associated passage hole corresponding to the first drain passage,

wherein a second spool valve element is slidably arranged in the second valve body and comprises a first valve portion for opening and closing the passage holes corresponding to the associated pump-side and cylinder-side portions and a second valve portion for opening and closing the associated passage hole corresponding to the second drain passage,

wherein a first resilient member is configured to bias the first spool valve element in the direction of closing-off a fluid communication between the associated pump-side and cylinder-side portions by the first valve portion and is configured to provide fluid communication between the associated cylinder-side portion and the first drain passage by the second valve portion, and

wherein a second resilient member is configured to bias the second spool valve element in the direction of closing-off a fluid communication between the associated pump-side and cylinder-side portions by the first valve portion and is configured to provide fluid communication between the associated cylinder-side portion and the second drain passage by the second valve portion.

Similarly, as amended claim 15 recites a power steering system that includes, among other possible things (italic emphasis added):

means for detecting and outputting a steering torque;

first and second passages, each including a pump-side portion and a cylinder-side portion;

a hydraulic cylinder with first and second chambers, the first and second chambers being connected to the first and second passages, respectively;

a hydraulic pump which is configured to supply and discharge a hydraulic pressure to and from the first and second chambers of

the hydraulic cylinder in accordance with the steering torque detected and outputted by the means for detecting and outputting steering torque;

a drain passage connected to at least one of the first and second passages; and

a switching valve arranged at a connection of the drain passage and the at least one passage,

wherein when the hydraulic pump operates to discharge the hydraulic pressure to the at least one passage, the switching valve provides fluid communication between the pump-side and cylinder-side portions of the at least one passage and closes-off the drain passage,

wherein when the hydraulic pump stops, the switching valve provides fluid communication between the cylinder-side portion of the at least one passage and the drain passage,

wherein the switching valve comprises a valve body formed with a plurality of passage holes communicating with the pump-side and cylinder-side portions of the at least one passage and the drain passage,

wherein a spool valve element is slidably arranged in the valve body and comprises a first valve portion for opening and closing the passage holes corresponding to the pump-side and cylinder-side portions and a second valve portion for opening and closing the passage hole corresponding to the drain passage, and

wherein a resilient member is configured to bias the spool valve element in the direction of closing-off a fluid communication between the pump-side and cylinder-side portions by the first valve portion and is configured to provide a fluid communication between the cylinder-side portion and the drain passage by the second valve portion.

For at least the following reasons, neither Sakaki nor Yokota teaches or suggests a power steering system of the type recited in claims 1, 14, and 15.

As above-italicized, claims 1, 14, and 15 recite a spool valve element that is slidably arranged in a valve body. By using a spool valve element, the switching operation to the hydraulic passages is gradually (*i.e.*, smoothly) performed. Correspondingly, the steering load applied to the driver via the steering wheel gradually (*i.e.*, smoothly) changes. Such a gradual change is enabled by the gradually changing size of the fluid opening as a result of the movement of the spool.

In contrast to the spool valve element (and the gradually changing steering load applied to the driver) recited in claims 1, 14, and 15, both Sakaki and Yokota teach rapidly switching poppet type switching valves. For example, Sakaki teaches poppet valves 141, 142 in Fig. 8 and Yokota teaches poppet valves 47, 48 in Fig. 6. As a result of the rapid switching of the poppet valves, the steering load applied to the driver is reduced rapidly (not gradually), thereby subjecting the driver to discomfort.

In light of the foregoing reasons, it is clear that neither Sakaki nor Yokota teaches or suggests at least a spool type valve that includes "a spool valve element [that] is slidably arranged in the valve body." Accordingly, neither Sakaki nor Yokota can be used to reject claims 1, 14, and 15, or any claim dependent thereon, under 35 U.S.C. §§ 102(b), 102(e). Moreover, as claims 3-13 depend from claim 1, each of these dependent claims is also allowable over Sakaki and Yokota, without regard to the other patentable limitations recited therein. Accordingly, a withdrawal of the various rejections of claims 1 and 3-15 under 35 U.S.C. § 102 is both warranted and respectfully requested.

CONCLUSION

For the aforementioned reasons, claims 1 and 3-15 are now in condition for allowance. A Notice of Allowance at an early date is respectfully requested. The Examiner is invited to contact the undersigned if such communication would expedite the prosecution of the application.

Respectfully submitted,

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